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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,150	01/14/2002	Armin Schoppach	(Z) 99038 P US	4347

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EXAMINER
PRITCHETT, JOSHUA L

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 03/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/047,150	SCHOPPACH ET AL.	
	Examiner	Art Unit	
	Joshua L Pritchett	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 12-16* is/are rejected.

7)☒ Claim(s) *10-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed January 14, 2002 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but the information referred to therein has not been considered.

The information disclosure statement filed January 14, 2002 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3, 5-7 and 8-16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the

invention. Claim 1 in line 8 and claim 7 in line 2 recites the limitation of the mounting having a density of at most 2.5 x 10^3 kg/m^3 this claimed limitation is not present in the specification and therefore is not given significant patentable weight.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) Claim 1 in line 2recites the limitation, "at least a first optical element and second optical element, the first optical element." It is unclear which optical element the phrase "the first optical element" is referring to because the applicant previously states there **can** be more than one first optical elements ("at least a first optical element"). The remaining claims are dependent from claim 1 and therefore inherit the deficiencies thereof.

b) Claim 4 in lines 5-8 recites the limitation " a mirror comprising quartz" then "a mirror comprising SiN." It is unclear which mirror the applicant is claiming. The examiner suggests that the applicant split the claim up into a series of dependent claims to make the claim more understandable.

c) Claim 8 in line 2 recites the limitation "in a region of at least one of the optical elements." It is unclear what the applicant intends "in a region" to mean.

d) Claim 11 recites the limitation "the mirror surface" in line 2. There is insufficient antecedent basis for this limitation in the claim.

e) The remaining claim is dependent on claim 4 and therefore inherits the deficiencies thereof.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 5-6, 8-9, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hull (US 6,404,547) in view of Harnisch, B. "Ultra-lightweight C/SiC Mirror and Structures".

Regarding claims 1, 12 and 14, Hull teaches an optical system with a first optical element (13) and a second optical element (14), the first optical element and the second optical element being arranged at a predetermined distance from each other (col. 4 lines 7-9) by means of a mounting (17 and 18). Hull further teaches the mountings (18) comprise compensation elements (17) allowing a change from the predetermined distance between the first optical element and the second optical element (col. 4 lines 41-43). Hull teaches the compensation elements being made of metal (col. 6 lines 49-50). Hull further teaches the movement of the optical element based on temperature dependence (col. 4 lines 20-42). Hull does not teach the mountings having a density of at most $2.5x10^3$ kg/m^3. Harnisch teaches a C/SiC mirror mount, which has a density of

$2.23x10^3$ kg/m^3, commonly used in telescopes (page 4 col. 1). Based on the fact that the mounting and compensation elements are made of a different material, once Hull is modified as taught by Harnisch, the thermal expansion coefficients of the two will deviate from each other. Harnisch also teaches that temperature can affect the performance of a telescope (page 4 col. 1). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the mountings taught by Harnisch in the construction of the Hull telescope for the purpose of allowing the telescope to be lightweight and therefore portable without losing strength in the mountings.

Regarding claim 3, Hull teaches at least one of the optical elements comprising a mirror (col. 4 lines 2-3).

Regarding claim 5, Hull teaches at least one of the optical elements comprising a lens (11, col. 4 lines 7-9).

Regarding claim 6, Hull teaches the optical system being a telescope (10) and the first optical element being a primary mirror (13) and the second optical element being a secondary mirror (14).

Regarding claim 8, Hull teaches the compensation elements arranged in a region of at least one optical element, coaxially of an optical axis defined by the optical elements (Fig. 2).

Regarding claim 9, Hull teaches the compensation elements coaxially arranged with the primary mirror (Fig. 1).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull in view of Harnisch as applied to claim 1 above, and further in view of Murakami (US 6,160,867).

Hull in combination with Harnisch teaches the invention as claimed including sending the light to an imager (Fig. 1) but lacks reference for the use of the first and second optical element for lithography. Murakami teaches that similar mirrors can be used in telescopic view and lithography (col. 1 line 66 – col. 2 line 4). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the optical components of the Hull invention for lithographic purposes as taught by Murakami for the purpose of creating a permanent record of the viewed object for further study.

Claims 13 and 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull in view of Harnisch as applied to claim 3 above, and further in view of Neil (US 5,579,333).

Regarding claim 13, Hull in combination with Harnisch teaches the invention as claimed but lacks reference to the mirror surface being silicon nitride. Neil teaches the use of a silicon nitride mirror surface for use in temperature dependent optics (abstract lines 1-3). It would have been obvious to a person of ordinary skill in the art to have the Hull mirror surface be silicon nitride as taught by Neil for the purpose of using the mirror in a variety of temperature environments.

Regarding claim 16, Hull teaches the mirror direction connected to the mounting means (Fig. 7).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hull in view of Harnisch as applied to claim 3 above, and further in view of Atkinson (US 6,226,121).

Hull in combination with Harnisch teaches the invention as claimed but lacks the mirror being created by replication technique. Atkinson teaches the use of replication technique to create a mirror (abstract lines 17-19). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to create the Hull mirror by replication technique as taught by Atkinson for the purpose of inexpensive production costs.

Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harnisch in view of Hull and Neil.

Harnisch teaches the use of C/SiC mountings, which have a density of 2.23x103 kg/m3, to carry a mirror (Fig. 8). Harnisch does not teach the mirror being connected to a compensation means or mirror comprising silicon nitride. Hull teaches the use of mirrors in telescopes with compensation means, the compensation means comprising aluminum struts (col. 6 lines 49-50). Neil teaches the use of a silicon nitride mirror in temperature dependent optics (abstract lines 1-3). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the Harnisch mirror have the silicon nitride surface taught by Neil for the purpose of using the mirror in a variety of temperature environments and to include the Harnisch mirror in the Hull telescope for the purpose of viewing distance objects with precision and accuracy.

Allowable Subject Matter

Claims 10-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 10 is allowable over the prior art of record because the prior art fails to teach a telescope with a telescope tube, a first and second mirror facing one another from opposite ends of the tube, a mounting means with a density of at most 2.5 x 10^3 kg/m^3 and compensation elements capable of changing the distance between the first and second mirrors based on temperature dependence, the compensation means comprising at least three feet. The connection of the strut (17) to the mounting (18) in the Hull reference (Fig. 1a) does not teach or suggest the use of a compensation element connector comprising three feet.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schubert (US 5,138,484) teaches a telescope with mounting means similar to applicants but does not include compensation means.

Hanzawa (US 6,355,206) teaches the density of C/C SiC.

Watters (US 6,061,175) teaches a telescope with compensation means.

Kaplan (US 4,632,547) teaches a telescope with compensation means.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 703-305-7917. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JLP
March 4, 2003